Brachyarithmia

OR

THE RULES OF Arithmetick

In a short and easie Method.

Written

In variety of useful Hands.

BY

Will: Elder sculpsit

Edward Noon

Teacher of Writing & Accompts,

At the Hand & Pen in Maiden-lane,

Covent Garden.

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A UNIQUE ENGRAVED HANDWRITING BOOK.

Noon (Edward) Brachyarithmia or The Rules of Arithmetick in A Short and Easie Method. Written in variety of useful hands by Edward Noon Teacher of Writing & Accompts, At the Hand & Pen in Maiden-Lane, Covent Garden. Will. Elder Sculpsit. 4to 8 X 6½ ins. superb calligraphic title and 24 plates, engraved throughout, contemporary panelled calf, with early shelf labels on spine, all edges gilt, book plate of the Duke of Portland. (before 1700)

The ONLY KNOWN COPY of a superb Writing Book. No other work by its author has survived. Sir Ambrose Heal: The English Writing Masters knew of the existence of it only from an entry in Bagford's M.S. Catalogue of Copy Books. Bagford's note is "Mr. Edward Noon, He taught a School of Writing and Accompts in Maiden Lane, Covent Garden. His work Bracyarithmeticae or ye Rules of Arithmetick in a short and easy method written in a variety of useful hands. Graved by Wm. Elder in 4to". Heal's only other clue to Noon is a trade card in the Bagford Bills "At the Hand and Penn in Duke-Street Bloomsbury".

The book is a fine example of the elaborate English copy book at its exuberant best. The remarkable title is built up of two large birds, three male faces and a complication of flourishes. The plates labelled Numeration, Reduction of Money, Rule of Practice, Alligation, etc. etc. show a variety of hands and are enlivened with remarkable calligraphic birds and animals, including swans,

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Of Will. Elder the engraver we know a good deal more. An examination of the eight works engraved by him after 1682, recorded by Heal, makes it clear that none of them bears any relation to the Brachyaritmia. His name is omitted from the list of "surviving penmen" compiled in 1699 and it is probable that he was dead by this date and in consequence that the present work is also before that date".

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Numeration

Teacheth how to write down, and value any Number Propounded.

I. 1. 2, II. 3, III 4, IIII.	I0000, CCIↃↃ.	Names of the Places.
5, V. 6, VI. 7, VII.	50000, IↃↃↃ.	
8, VIII. or IIX. 9, IX.	I00000, CM.	
9, VIIII. I0, X. II, XI.	or CCCIↃↃↃ.	Number of the Places.
I2, XII. I3, XIII.	500000, IↃↃↃↃ.	
I4, XIIII. or XIV.	I000000.	
I5, XV. I6, XVI.	CCCCIↃↃↃↃ.	
I7, XVII. I8, XVIII.	I683, MDCLXXXIII.	
I8, IIXX. I9, XIX.		
I9, IXX. 20, XX.		
2I, XXI. 30, XXX.		
40, XL. 49, XLIX.		
50, L. 59, LIX.		
60, LX. 80, LXXX.		
90, XC. I00, C.		
200, CC. 300, CCC.		
500, D. or IↃ.		
600, DC. or IↃC.		
700, DCC. or IↃCC.		
800, DCCC. or IↃCCC.		
900, DCCCC. or IↃCCCC.		
I000, M. or CIↃ.		
5000, IↃↃ.		

The Table

C. Millions.	X. Millions.	M. Millions.	C. Thousa.	X. Thousa.	M. Thousa.	Hundreds.	Tens.	Units.
9	8	7	6	5	4	3	2	1
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9
1	2	3	4	5	6	7	8	9
	1	2	3	4	5	6	7	8
		1	2	3	4	5	6	7
			1	2	3	4	5	6
				1	2	3	4	5
					1	2	3	4
						1	2	3
							1	2
								1

Addition of Money

Addition is the Collecting of several sum̃s, into one product, or total sum̃.

Note	4 farthings	make	1 peny	Thus	pounds	lb
	12 pence		1 shilling	notes	shillings	s
	20 shillings		1 pound	viz.t	pence	d
					farthings	q

W E

Troy Weight

By this is weighed, Bread, Gold, Silver, Pearl, &c:

Note:	24 Grains	make	1 peny wt	This noted Viz:	hundreds Cl
	20 Peny wt		1 Ounce		quarters q
	12 Ounces		1 Pound		pounds lb
	25 Pounds		1 Quarter		ounces oz
	4 Quarters		1 Hundred wt		peny wts pw
					grains grs

But ye most usual Denominations are lb, ozs, pw, & grs:

Avoirdupois Weight

By this is weighed, Wool, ffleshe, Butter, Chees, Tin, Lead, Iron, Sugar, & Grants, &c:

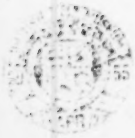
Note		make		Thus noted Vizt	
16 Drams		1 Ounce		Tuns	Tn
16 Ounces		1 Pound		Hundreds	Cwt
28 Pounds		1 Quarter		Quarters	qrs
4 Quarters		1 Hundred wt		Pounds	lb
20 Hundreds		1 Tun		Ounces	ozs
				Drams	drs

And 56 lb, $\frac{1}{2}$ C; 84 lb, $\frac{3}{4}$ C; and 112 lb, 1 C wt

Long Measures

By this is measured, Cloth, Board, Glass, Pavement, Land &c. Note 3 barley corns, make 1 inch; 12 inches 1 foot; 3 foot, 1 yard; 3 foot, 9 inches, 1 Ell; 6 foot, 1 fathom; 16 foot ½ (or 5 yd ½) 1 pole, or perch; 40 perches, 1 furlong; 8 furlongs (or 1760 yds) 1 English Mile

And 4 nails, is 1 qr of a yd; 4 qrs 1 yd; 5 qrs 1 Ell Eng; & 3 qrs 1 Ell flem.



Liquid Measures

	Make	
2 Pints		1 Quart
2 Quarts		1 Pottle
2 Pottles		1 Gallon
8 Gallons		1 Firkin of Ale Soape or Herrings
9 Gallons		1 Firk of Beer
10½ Gallons		1 Firk of Salmon or Eells
2 Firkins		1 Kilderkin
2 Kilderkin		1 Barrel
42 Gallons		1 Tierce of Wine
63 Gallons		1 Hogshead
2 Hogsheads		1 Pipe or Butt
2 Butts		1 Tun of wine

Apothecaries Weights

	Make	
20 Grains		1 Scruple
3 Scruples		1 Dram
8 Drams		1 Ounce
12 Ounces		1 Pound

DRY MEASURES

	Make	
2 Pints		1 Quart
2 Quarts		1 Pottle
2 Pottles		1 Gallon
2 Gallons		1 Peck
4 Pecks		1 Bush land mea
5 Pecks		1 Bush water mea
8 Bushells		1 Quarter
36 Bush		1 Chalder
40 Bush		1 W'ey
80 Bush		1 Last of Corn

TIME

	Make	
60 Minutes		1 Hour
24 Hours		1 Day natural
7 Days		1 Week
4 Weeks		1 Mo of 28 days
13 Moneths		1 Year
1 day 6 hours		

Subtraction

Is the taking a less Number from a greater to find the Remainder or difference

Multiplication

Compendiously performs the work of many Additions; and bringeth great Denominations into small.

In which you must observe three things.

1st The Multiplicand, or Number to be Multiplied.
2dly The Multiplicator; or Number by wch you Multiply.
3dly The Product; or Number produced. wch Number contains the Multiplicand, as oft as ye other doth Unitie.

Multiplication is 3 fold viz.

1st Single, 2dly Double, or Compounded; 3dly Continual.

The Table

2	3	4	5	6	7	8	9
2 = 4	3 = 9	4 = 16	5 = 25	6 = 36	7 = 49	8 = 64	9 = 81
3 = 6	4 = 12	5 = 20	6 = 30	7 = 42	8 = 56	9 = 72	0 =
4 = 8	5 = 15	6 = 24	7 = 35	8 = 48	9 = 63	0 =	
5 = 10	6 = 18	7 = 28	8 = 40	9 = 54	0 =		
6 = 12	7 = 21	8 = 32	9 = 45	0 =			
7 = 14	8 = 24	9 = 36	0 =				
8 = 16	9 = 27	0 =					
9 = 18	0 =						

Division.

Sheweth how oft a less number is contained in a greater;
And bringeth small denominations into great.

In which you must observe four things.

1st. The Dividend; or number to be Divided.
2dly. The Divisor; or number by wch you Divide.
3dly. The Quotient; or number Produced.
4thly. The Remains; which is uncertain.

These 3 are Certain

To work Division

First you must ask how oft in Quotient answer make,
Then Multiply Subtract a new Dividual take.

Reduction of Money, Weights, & Measures

This is twofold: 1st to bring great Denominations into Small: 2dly to bring small Denominations into Great:

For

lb	Multiplied by	20	are	d	q	Divided by	4	are	d
d		12		d	d		12		d
d		4		q	d		20		lb
Ells	Multiplied by	5	are	qrs	nā	Divided by	4	are	qrs
yds		4		qrs	qrs		4		yds
qrs		4		nā	qrs		5		Ells
Tn	Multiplied by	20	are	Ls	dr	Divided by	16	are	ozs
Ls		4		qrs	oz		16		lb
qrs		28		lb	lb		28		qrs
lb		16		ozs	qrs		4		Ls
oz		16		dr	Ls		20		Tn

TARE and TRET

The Aliquot parts of 112 lb

Tare, is ye Weight allowed for ye Butt, Chest, Cask, Wrapper, &c

84 lb is	$\frac{3}{4}$ of a Ct	7 is	$\frac{1}{16}$ of a Ct
56 =	$\frac{1}{2}$ = =	16 =	$\frac{1}{7}$ = =
28 =	$\frac{1}{4}$ = =	8 =	$\frac{1}{14}$ = =
14	$\frac{1}{8}$ = =	4 =	$\frac{1}{28}$ = =

Tret, is an allowance of 4 lb upon every 104, for all goods Garblable.

Reduction of divers Coyns

To work these Questions, bring your Second and third numbers into one Denomination; Then Multiply ye 1st, by ye 2d, and Divide by ye 3d.

The Rule of Proportion OR Golden Rule Is Direct or Inverse

For

If more require more; or less less; It is the Rule Direct:
If more require less, or less more; It is ye Rule Inverse.

To work the Direct Rule

Multiply the 2d Number by ye 3d; and Divide by the 1st.

To work the Inverse Rule

Multiply the 1st Number by ye 2d; and Divide by the 3d.

The Rule Compound of Five Numbers

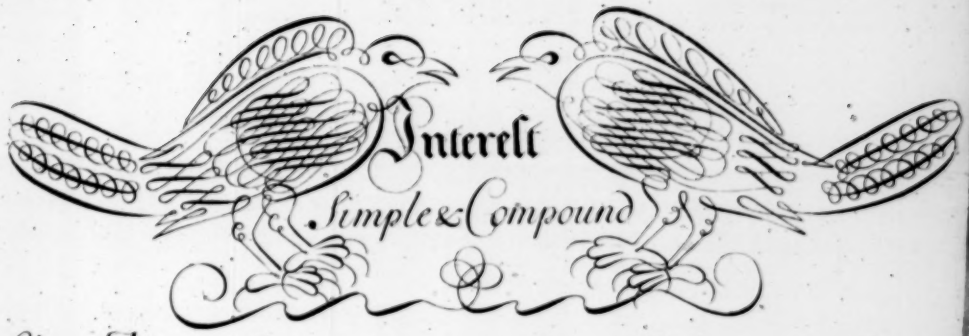
Is also Direct or Inverse.

To work y.e Rule Direct

Multiply the first and second terms for Divisor, and the third fourth and fifth for Dividend.

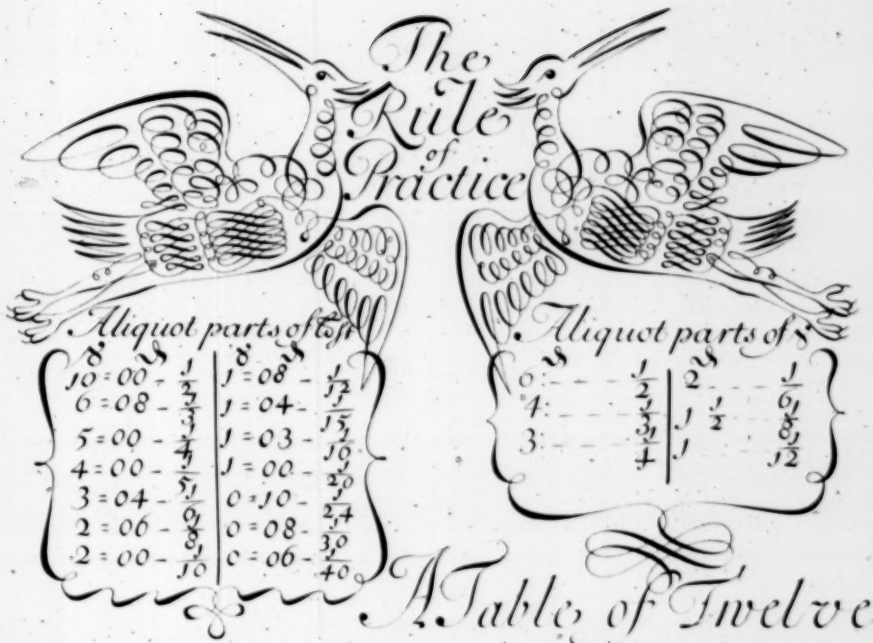
To work y.e Rule Inverse

Multiply the third and fourth terms for Divisor, and y.e first second and fifth for Dividend.



Simple. Is the money arising from y^e^ Principal onely.

Compound. Is the money arising from y^e^ Principal and Interest, being forborn a certain time.



The Rule of Practice

Aliquot parts of £ to ſ

ſ	ſ		ſ	ſ	
10 =	00 -	$\frac{1}{2}$	1 =	08 -	$\frac{1}{12}$
6 =	08 -	$\frac{1}{3}$	1 =	04 -	$\frac{1}{15}$
5 =	00 -	$\frac{1}{4}$	1 =	03 -	$\frac{1}{16}$
4 =	00 -	$\frac{1}{5}$	1 =	00 -	$\frac{1}{20}$
3 =	04 -	$\frac{1}{6}$	0 =	10 -	$\frac{1}{24}$
2 =	06 -	$\frac{1}{8}$	0 =	08 -	$\frac{1}{30}$
2 =	00 -	$\frac{1}{10}$	0 =	06 -	$\frac{1}{40}$

Aliquot parts of ſ

ſ		ſ	
0 :	$\frac{1}{2}$	2	$\frac{1}{6}$
4 :	$\frac{1}{3}$	1 $\frac{1}{2}$	$\frac{1}{8}$
3 :	$\frac{1}{4}$	1	$\frac{1}{12}$

A Table of Twelves

1 x 12 = 12	4 x 12 = 48	7 x 12 = 84	10 x 12 = 120
2 x 12 = 24	5 x 12 = 60	8 x 12 = 96	11 x 12 = 132
3 x 12 = 36	6 x 12 = 72	9 x 12 = 108	12 x 12 = 144

Fellowship

Discovers the particular Gain or Loss of every man.

And is Twofold

1ly with equal time; 2ly with different time.

Barter

Is the Exchanging one Commodity for another

Rebate or Discount

Is the finding such present money, as would satisfie a Debt due any time to come.

EXCHANGE of Coyns, wts, & measures.

This is to Deliver Money &c, in one Nation (or Countrey) and Receive the like value in another.

Loſs and Gain

hath 4 branches

1st To know what is gaine, or lost, p Ct, p yd, p Ell, p lb, xs.

2dly When Wares sold at sush a rate, there is so mush gaine, or lost, p Ct, To know what would be gaine or lost p Ct, if sold at another Rate.

3dly To know how a Domodity must be Sold, to gain or lose so much p Ct.

4thly There being so much gaine or lost p Ct, to know what the Dommodity cost.

Alligation

Is the binding of Divers Simples, of Several prices; to find a mean price. And is threefold.

1st. Medial 2dly. Total 3dly. Partial

False Position

Is twofold, Single & Double

Extraction of the Square and Cube ROOTS

Sq	1	4	9	16	25	36	49	64	81
Ro	1	2	3	4	5	6	7	8	9
Cu	1	8	27	64	125	216	343	512	729